

FACTORY AUTOMATION

MELSERVO MR-J5

Servo Motion System



MITSUBISHI ELECTRIC SERVO SYSTEM
MELSERVO-J5

- // AI-based maintenance functions
- // Fast commissioning through auto-tuning
- // Top performance: compact & flexible

ADVANCED AMPLIFIER TECHNOLOGY

Discover the globally proven MELSERVO MR-J5 servo amplifier series from Mitsubishi Electric, which has established itself across many industrial sectors, such as mechanical engineering and fully automated production systems. Our single- and multi-axis systems fully comply with international standards and, of course, bear the CE mark.

With an impressive speed/frequency response of 3.5 kHz, our servo amplifiers and servomotors react with lightning speed and extreme precision to a wide range of commands, even when speed changes or position shifts occur. This response behaviour is crucial for the performance, accuracy and responsiveness of your system. Here, we excel with our advanced real-time tuning functions, which guarantee quick and easy commissioning.

The models in the MR-J5 series are currently available with output powers ranging from 50 W to 22 kW, and we are regularly expanding our range of power classes. Furthermore, our HS models offer additional advantages by enabling the use of safe I/O signals with spring terminals, allowing for a more flexible and straightforward installation setup.

Safety functions

All common safety functions on board STO, SS1, SBC, SSM, SLS, SS2, SOS

Robustness

Designed for ambient temperatures of up to + 60°C



High Performance Series MELSERVO MR-J5

MR-J5-G-RJ / HS (NETWORK COMPATIBLE)

Experience the future of industrial networking with the seamless integration of G-Series servo drives into the advanced CC-Link IE TSN network. With CC-Link IE TSN, you benefit from the most advanced network technology, combining the bandwidth of Gigabit Ethernet with the precision of Time-Sensitive Networking (TSN). CC-Link IE TSN communication enables the setting of security sub-functions.

- Gigabit Ethernet with TSN
- Single network solution for motion
- Minimum communication cycle of 31.25 μ s
- 2 and 3 axes amplifiers
- predictive maintenance functions



MR-J5-G-N1 (NETWORK COMPATIBLE WITH ETHERCAT)

With the N1 specification of the network-compatible amplifiers, you can utilise safety functions via your EtherCAT network. The device supports specific protocols such as FSoE, FoE, CoE and EoE, allowing you to integrate both safety-related and non-safety-related communication within a single network.

- EtherCAT compatible
- Safety over EtherCAT
- Functions: (FSoE), FoE, CoE, EoE
- Minimum communication cycle of 125 μ s
- EtherNet/IP® support
- Servo autotuning via EtherCAT



MR-J5D-G DRIVE UNITS

Our drive unit is available in various configurations for 1 to 3 axes to suit your requirements. Combining it with an MR-CV_4 power regeneration unit makes your servo system not only energy-efficient, but also environmentally friendly.

- 1-,2-,3-axis amplifier available
- Common DC link with regenerative power supply
- Same specification as MR-J5-G-RJ
- Same general specification and functions like MR-J5-G



MR-J5-B-RJ (OPTICAL FIBER) / MR-J5-A-RJ (PULSE TRAIN XD)

Thanks to integrated support for the SSCNET III/H optical network, the MR-J5-B enables motion control with a communication cycle time of 0.222 ms. Our compact multi-axis amplifier solution controls up to three axes via the optical network.

With the MR-J5-A-RJ amplifier, you can control position precisely using pulse commands and control speed and torque effortlessly using analogue voltage commands. With a switchable control mode and support for pulse trains and analogue inputs as command interfaces, it offers flexible solutions to meet your requirements.

- Seamless integration thanks to 'plug-and-play' with SSCNETIII/H network
- Communication cycle time of only 0.222 ms
- Precise processing of pulse train signals for maximum accuracy
- Flexible control options with analogue setpoint inputs



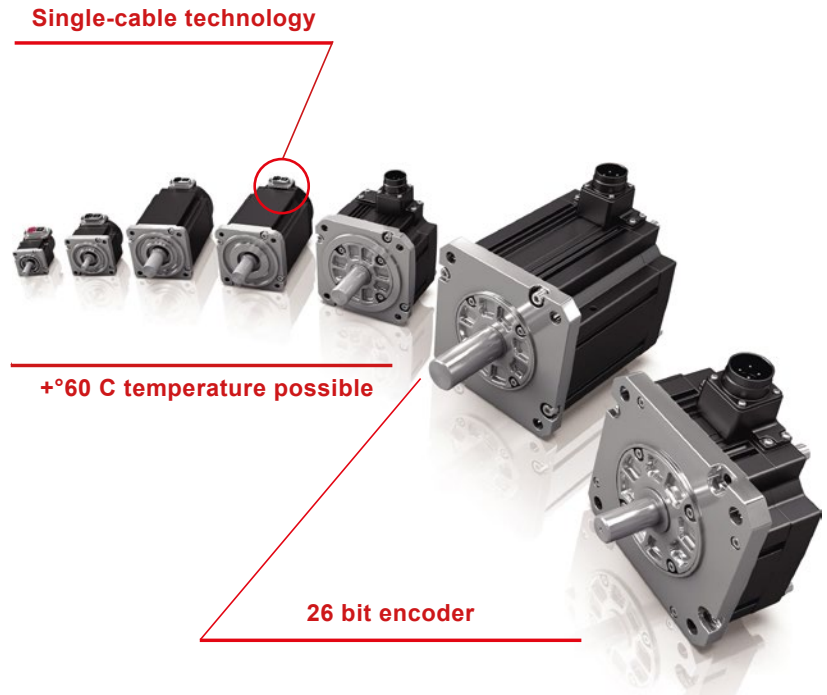
ADVANCED MOTOR SOLUTIONS

HK series rotary servomotors

Discover our pioneering servomotors, which are extremely compact and powerful thanks to innovative and patented winding technologies that also minimise the use of rare earth elements. Featuring an integrated, batteryless absolute encoder, they offer an exceptionally high resolution of 26 bits, corresponding to 67,108,864 pulses per revolution.

Our wide range of power classes, from 50 W to 22 kW, perfectly covers a diverse array of applications. Furthermore, the motor speed has been increased from 6000 rpm to 6700 rpm in low inertia motors and even up to 10 000 rpm in ultra low inertia (HK-MT) ones.

The servomotors can be controlled by both 200V and 400V AC power supply depending on the amplifier version, allowing applications to be realised with greater flexibility.



HK-KT-SERIES

Due to low inertia of motor shaft the series is perfect for most typical implementation of servo drives on the market. Additionally its rated speed is 3000 rpm so perfect balance between inertia value, rated speed and rated torque is obtained which results in perfect working in typical FA applications like manipulators, machines in FMCG or even CNC.

// Power class: 0.05 kW – 2 kW

HK-MT-SERIES

Designed with ultra low mass moment of inertia, this series is ideal for highly dynamic positioning tasks with short cycle times. It is particularly well suited for use in automatic placement machines, assembly machines, and automatic welding machines.

// Power class: 0.05kW – 1kW

HK-ST-SERIES

With medium moment of inertia of the motor shaft these motors are perfect for applications which have a big inertia moment like lift or R2R machines. Also, due to its bigger torque and slower rated speed (2000 rpm) implementation in this kind of applications is easier.

// Power class: 0.5 kW – 7 kW

HK-RT-SERIES

With ultra low mass moment of inertia and compact design, this series has been specially developed for positioning tasks requiring particularly short cycle times. Typical applications include roll-to-roll processes as well as loading and unloading stations.

// Power class: 1kW – 7kW

HK-JT SERIES

The series is ideal for demanding industrial applications requiring dynamic and precise motion control. With rated speeds and torque optimised for high-load performance, HK-JT motors deliver stable operation in applications such as large manipulators, heavy-duty packaging lines, and metal processing machines.

// Power class: 7 kW – 22 kW



2 Linear motors

Our products include state-of-the-art solenoids and coils, designed for easy installation in compact systems. These components not only guarantee high system rigidity but also offer a particularly long service life.

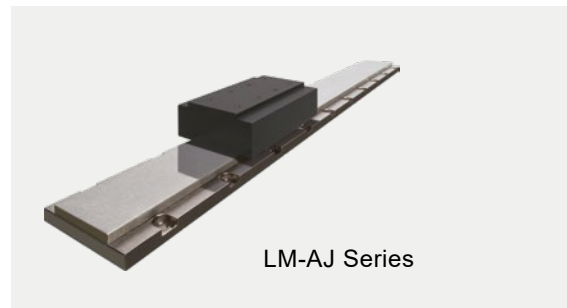
They fully unleash their potential, particularly in X-Y tables, and provide numerous advantages.

LM-AJ-SERIES

- Ferrous
- Very low cogging force (cogging)
- High feed force
- Continuous forces from 70 N to 450 N
- Peak forces from 215 N to 14,101 N
- Speeds from 2 m/s to 6.5 m/s

LM-AU-SERIES

- Ironless
- No cogging force (zero cogging)
- Low iron mass for high dynamics
- Continuous forces from 30 N to 350 N
- Peak forces from 122 N to 1,764 N
- Speeds from 2 m/s to 4.5 m/s



LM-AJ Series



LM-AU Series

3 Direct Drive motors / Rotary indexing tables

Our rotary indexing tables use directly driven rotary motors, eliminating the need for external transmission media such as belts or gears. This ensures high-precision positioning.

Equipped with guides, a torque motor, encoder feedback, and a protective cover, they require minimal maintenance and are characterised by a low noise level. An absolute encoder, providing up to 4,000,000 pulses per revolution, is installed.

TM-RFM

- Robust construction
- High performance
- Designed for high load capacity
- Equipped with a high-value absolute encoder as standard
- Low wear due to no gearbox

TM-RU2M / TM-RG2M

- Flat design
- Designed for dynamic applications
- Excellent for low-profile scanning applications
- Equipped with a high-value absolute encoder as standard
- Low wear due to no gearbox



TM-RFM



TM-RU2M

OVERVIEW OF THE CONTROL OPTIONS

MOTION MODULE

Take advantage of the variety of our motion modules, available in two versions. Our Simple Motion Modules, offered in the MELSEC iQ-R and MELSEC iQ-F series, provide a wide range of control, synchronisation, and cam functions. With simple parameter settings and PLC programs, you can effortlessly use these functions to optimise your motion control. For even more demanding applications, the MELSEC iQ-R series offers an extended motion mode with with market-standard PLCOpen®. Motion Control function blocks. These enable precise motion control

within standardised programming, ensuring the efficient and transparent implementation of your motion applications. Discover the future of motion control with Mitsubishi Electric.

The main difference between Simple Motion and Motion modules is that on SM program is being stored on PLC which reduces the number of available PLC steps. From other hand, Motion modules stores the program on module itself which leaves more memory in PLC for general program as well as allows even 32.25 us of network cycle.



Compact series: MELSEC iQ-F
Performance Series: MELSEC iQ-R



MOTION CONTROL SOFTWARE (SWM-G)

The SWM-G motion control software enables advanced software-based motion control in a PC environment. This allows you to realise your motion applications in high-level languages such as C# or C++ and take advantage of our ready-made libraries for complex interpolation tasks, among other functions.

Utilise your PC system to conveniently control up to 128 axes based on the Windows kernel. We also offer integrated FSoE functionality to implement safety functions via the EtherCAT network.

NETWORKS

Discover the versatility of our hardware, which is compatible with multiple networks, including our own real-time capable CC-Link IE TSN network and the EtherCAT network. Our solutions offer flexibility and reliability, ensuring seamless integration into your existing infrastructure.

Choose your preferred network and maximise the efficiency of your installations with Mitsubishi Electric.



REASONS FOR OUR MOTION SYSTEMS

KI-BASED MAINTENANCE FUNCTION

Our motion systems are equipped with advanced maintenance support functions, including a built-in AI-based predictive maintenance feature. This function continuously monitors external mechanical drive components, such as ball screws, gearboxes, and belts. By detecting changes such as decreasing belt tension or increasing backlash in the gearbox, the system can issue early maintenance alerts. With this innovative solution, you can equip any machine with predictive maintenance capabilities to increase productivity and reduce unexpected downtime. Rely on Mitsubishi Electric to optimise your machine performance and reduce operating costs.

FAST COMMISSIONING

Our state-of-the-art control algorithms enable fast commissioning and provide powerful tuning functions to elevate the productivity of your system. These functions include our unrivalled auto-tuning feature, which continuously optimises performance, accuracy, and efficiency. This feature dynamically responds to changing conditions, ensuring optimal servo system performance over time. The result? A faster and more precise response to control commands, significantly improving the overall performance of your machine. Discover the future of motion control with the J5 series from Mitsubishi Electric. Plug and play – simply plug in and get started!

TOP PERFORMANCE COMPACT & FLEXIBLE

Our systems impress with their compactness, performance, and durability. Thanks to their flexible integration into industrial networks such as EtherCAT and safety functions via network (FSoE), they seamlessly fit into any standard system. Mitsubishi Electric represents proven quality and innovation across all industrial sectors. Optimise your systems now with Mitsubishi Electric servo systems and benefit from outstanding performance and reliability for your success!





Mitsubishi Electric's e-F@ctory concept utilises both FA and IT technologies to reduce the total cost of development, production and maintenance, with the aim of achieving manufacturing that is 'the step ahead of the curve'. It is supported by e-F@ctory Alliance partners covering software, equipment and system integration, creating the optimal e-F@ctory architecture to meet end customers needs and investment plans.



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